

1. A process for making Nitinol rolling bearing elements of a desired shape, comprising:
- making a ceramic mold having a cavity with an internal shape like said desired shape of said rolling bearing elements;
- pouring molten Nitinol into said cavity;
- cooling said mold and said Nitinol in said cavity to produce a solidified Nitinol form; and
- disintegrating said mold to remove said Nitinol form .
2. A process as defined in claim 1, further comprising:
- after removal of said Nitinol form from said mold, subjecting said Nitinol form to hot isostatic pressing at about 1650°F and 20,000 psi for about 2 hours.
3. A process as defined in claim 1, wherein said rolling bearing element is a cylindrical roller bearing roller and said Nitinol form is a rod, and further comprising:
- centerless grinding said rod to the desired maximum diameter of said roller elements; and;
- cutting said rod to individual rollers about the length of said roller bearing elements.
4. A process as defined in claim 3, further comprising:
- centerless grinding said individual rollers to the desired diameter and profile of said roller elements.
5. A process for making Nitinol ball bearing elements, comprising:
- making a ceramic mold having elongated branches with spherical ball cavities therein;
- pouring molten Type 60 Nitinol into said mold and allowing said molten Nitinol to flow into and fill said spherical ball cavities;
- cooling said mold and said Nitinol in said mold to produce a solidified branch of connected Nitinol balls;
- breaking said mold away from said Nitinol balls; and
- separating said balls from said branch.

6. A process for making Nitinol ball bearing elements as defined in claim 5, further comprising:

after removal of said Nitinol branch of connected balls from said mold, subjecting said Nitinol branch of connected balls to hot isostatic pressing at about 1650°F and 20,000 psi for about 2 hours.

7. A process for making Nitinol ball bearing elements as defined in claim 5, further comprising:

grinding said balls to smooth spheres of the desired diameter.

8. A process as defined in claim 5, further comprising:

heating said balls to about 950°C and liquid quenching to harden said balls to about 62RC and produce a hard integral ceramic surface on said balls.

9. A Nitinol ball bearing element, comprising:
a sphere of Type 60 Nitinol.

10. A Nitinol roller bearing element, comprising:
a rod of Type 60 Nitinol.

11. A process as defined in claim 2, further comprising:
heating said Nitinol form to an elevated temperature in a range of about 800°C-950°C and rotary forging said Nitinol bar at said elevated temperature to produce a hot-worked rod having a diameter slightly greater than the desired diameter of said roller bearing elements.

12. A process for making balls out of a material such as Nitinol that is difficult or impossible to form into a ball, comprising:

selecting a sheet or plate of said material;
cutting ball blanks out of said sheet or plate; and
grinding said ball blanks in a ball grinder to a desired spherical shape and size.

13. A process as defined in claims 12, wherein:
said ball blanks are cubical in shape.

14. A process as defined in claim 12, wherein:

said ball blanks are cylindrical in shape.

15. A process as defined in claim 12, wherein:

said ball blanks are cut out of said sheet or plate by an industrial cutting laser.

16. A process as defined in claim 12, wherein:

said ball blanks have a center and six equal orthogonal dimensions through said center.

17. A process as defined in claim 16, further comprising:

tumbling said ball blanks in and abrasive tumbler to round off corners and edges of said ball blanks prior to grinding said ball blanks in said ball grinder.

18. A process for making Nitinol bearing races, comprising:

selecting a tube made of Type 60 Nitinol and having a central axis;

cutting bearing race blanks off said tube on a cutting plane perpendicular to said central axis;

grinding or machining said race blanks to desired outside dimensions and interior configuration.

19. A process as defined in claim 18, further comprising:

heat treating said race blanks to about 900°C and quenching to produce hardness of above about 58RC.

20. A bearing race, comprising:

an annular ring of Type 60 Nitinol.